- 3 O'Driscoll K, Foley M. Correlation of decrease in perinatal mortality and increase in caesarean section rates. *Obstet Gynaecol* 1983;61:1-5.
- 4 O'Driscoll K, Foley M, MacDonald D. Active management of labor as an alternative to caesarean section of dystocia. *Obstet Gynaecol* 1984;63:485-90.
- 5 Leveno KJ, Cunningham G, Pritchard JA. Caesarean section: an answer to the House of Horne. *Am J Obstet Gynecol* 1985;153:838-44.
- 6 Scott JS. Dublin deliveries. *BMJ* 1981;282:1064.
- 7 Philpott RH, Castle WM. Cervicographs in the management of labour in primigravidae. *Journal of Obstetrics and Gynaecology of the British Commonwealth* 1972;79:592-8.
- 8 Studd JWW. Partograms and nomograms of cervical dilatations in management of primigravid labour. *BMJ* 1973;iv:451-5.
- 9 Friedman EA. *Labor, clinical evaluation and management*. 2nd ed. New York: Appleton-Century-Crofts, 1978.
- 10 Turner MJ, Webb JB, Gordon H. Active management of labour in primigravidae. *J Obstet Gynaecol* 1986;7:79-83.
- 11 Turner MJ, Brassil M, Gordon H. Active management of labor associated with a decrease in the caesarean section rate in nulliparas. *Obstet Gynecol* 1988;71:150-4.
- 12 Akoury HA, Brodie G, Caddick R, McLaughlin VD, Pugh PA. Active management of labor and operative delivery in nulliparous women. *Am J Obstet Gynecol* 1988;158:255-8.
- 13 Van Alten D, Eskes M, Treffers PE. Midwifery in the Netherlands: the Wormerveer study: Selection, mode of delivery, perinatal mortality and infant morbidity. *Br J Obstet Gynaecol* 1989;96:656-62.
- 14 Rochenschaub A. Technology-free obstetrics at the Semmelweis clinic. *Lancet* 1990;335:977-8.
- 15 Caldeyro-Barcia R, Hech E. Effect of rupture of the membranes on fetal heart rate patterns. *Int J Gynaecol Obstet* 1972;10:169-72.
- 16 Kierse MJNC. Augmentation of labour. In: Chalmers I, Enkin M, Kierse MJNC, eds. *Effective care in pregnancy and childbirth*. Oxford: Oxford University Press, 1989:951-66.
- 17 Fraser WD, Marcoux S, Moutquin JM, Christen A. Effect of early amniotomy on the risk of dystocia in nulliparous women. *N Engl J Med* 1993;328:1145-9.
- 18 UK Amniotomy Group. Comparing routine versus delayed amniotomy in spontaneous first labor at term—a multicentre randomized trial. *Online J Curr Clin Trials* 1994;3:122.
- 19 Fraser WD. Amniotomy to shorten spontaneous labour. In: Enkin MW, Kierse MJNC, Renfrew MJ, Neilson JP, eds. *Pregnancy and Childbirth Module, Cochrane Database of Systematic Reviews*. 1992, September 30: 04134. (Published through Cochrane Updates on Disk. Oxford: Update Software, 1993, Disk Issue 2.)
- 20 Barrett JFR, Savage J, Phillips K, Lilford R. Randomised trial of amniotomy in labour versus the intention to leave membranes intact until the second stage. *Br J Obstet Gynaecol* 1992;99:5-9.
- 21 Fraser WD. Early oxytocin to shorten spontaneous labour. In: Enkin MW, Kierse MJNC, Renfrew MJ, Neilson JP, eds. *Pregnancy and Childbirth Module, Cochrane Database of Systematic Reviews*. 1992, August 27: 04136. (Published through Cochrane Updates on Disk. Oxford: Update Software, 1993, Disk Issue 2.)
- 22 Bréart G, Mlika-Cabane N, Kaminski M, Alexander S, Herruzo-Nalda A, Mandruzzato P, et al. Per partum care in EC countries—preliminary results of a European concerted action. In: Koppe JG, Eskes TKAB, van Geijn HP, Wiesenhaan PF, Ruys JH, eds. *Care, concern and cure in perinatal medicine*. Carnforth, Lancashire: Parthenon, 1993:39-46.
- 23 Cohen GR, O'Brien WF, Lewis L, Knuppel RA. A prospective randomized study of the aggressive management of early labor. *Am J Obstet Gynecol* 1987;157:1174-7.
- 24 Lopez-Zeno JA, Peaceman AM, Adashek JA, Socol ML. A controlled trial of a program for the active management of labor. *N Engl J Med* 1992;326:450-4.
- 25 Fraser WD. Early amniotomy and early oxytocin for delay in labour compared to routine care. In: Enkin MW, Kierse MJNC, Renfrew MJ, Neilson JP, eds. *Pregnancy and Childbirth Module, Cochrane Database of Systematic Reviews*. 1992, July 28: 06949. (Published through Cochrane Updates on Disk. Oxford: Update Software, 1993, Disk Issue 2.)
- 26 Hodnett ED. Support from caregivers during childbirth. In: Enkin MW, Kierse MJNC, Renfrew MJ, Neilson JP, eds. *Pregnancy and Childbirth Module, Cochrane Database of Systematic Reviews*. 1993, May 12: 03871. (Published through Cochrane Updates on Disk. Oxford: Update Software, 1993, Disk Issue 2.)
- 27 O'Driscoll K, Stronge J, Minogue M. Active management of labour. *BMJ* 1973;iii:135-7.
- 28 Cartmill RSV, Thornton JG. Obstetric decision making: the effect of varying the presentation of partogram information. *Lancet* 1992;339:1520-2.

(Accepted 8 June 1994)

Deaths, HIV infection, abstinence, and other outcomes in a cohort of injecting drug users followed up for 10 years

J Roy Robertson, Peter J M Ronald, Gillian M Raab, Amanda J Ross, Tamiza Parpia

Abstract

Objective—To trace, follow up, and interview a group of patients known to be injecting drug users in order to establish current drug taking and other features related to drug use over 10 years.

Design—Descriptive follow up study of a cohort of injecting drug users established between 1982 and 1985.

Setting—General practice based patient population study initially, with later tracing of subjects throughout the United Kingdom through NHS Central Registries and current general practitioners.

Subjects—203 injecting drug users recruited up to December 1985.

Main outcome measures—Survival, cause of death, abstinence, or continued drug use; HIV status; and demographic variables.

Results—Of the 203 injecting drug users recruited into the study, over half were known to be HIV positive and 42 died of various causes (increasingly AIDS). From the start of follow up in 1990, 163 (91%) of the 180 survivors were traced, of whom 116 (71%) were interviewed. Dramatic changes had occurred in drug taking, with a move away from injecting towards oral drug use. A few patients, however, continued to inject. 90 (78%) of those interviewed had been in prison, of whom 37 (41%) had injected drugs while in prison.

Conclusions—The pattern of deaths had changed from being largely due to overdose in the early 1980s to predominantly AIDS related in later years. The reduction in deaths due to overdose may have been connected with but was not always causally related to a new approach by legal, social, and medical services. Drug use continues in a modified form in a large proportion of patients followed up. As a group,

drug users require long term support for a multiplicity of problems.

Introduction

Since HIV infection was first transmitted by injecting drug use interest has focused on known drug users. Previously mortality and morbidity outcomes such as hepatitis B and later hepatitis C and death due to overdose, violence, and infections were studied.¹⁻³ Abstinence has also been the subject of much research.⁴⁻⁶ Guidelines for clinical practice have reflected a new concern about the whole issue of drug use and HIV⁶⁻⁹ and show a change from the previous non-medical approach.¹⁰⁻¹¹ Drug use is notoriously difficult to study because of changing patterns of drug use, evolving policy, and its illegality.

The Edinburgh drug addiction study recruited a cohort of known injecting drug users between 1980 and 1985 and has followed them up continually since then. Earlier reports on this cohort showed a high seroprevalence for HIV antibody¹² and later a rapid decline in injecting drug use.¹³⁻¹⁵ A recent report showed a change to heterosexual transmission of HIV in this group.¹⁶ This paper reports a formal follow up evaluation of drug taking morbidity and mortality in the cohort up to mid-1993.

Subjects and methods

Individual drug injectors were recruited into the study after consultation with one of the doctors of the Muirhouse Medical Group. The cohort was closed at the end of 1985 and numbered 203 subjects. Follow up was carried out between January 1990 and June 1993. At the start of this study 23 of the original 203 subjects

Edinburgh Drug Addiction Study, Muirhouse Medical Group, Edinburgh EH4 4PL
J Roy Robertson, general practitioner
Peter J M Ronald, research associate

MRC Biostatistics Initiative for AIDS and HIV Research in Scotland, Centre for HIV Research, Edinburgh EH9 3JN
Gillian M Raab, statistician
Amanda J Ross, statistician
Tamiza Parpia, statistics student

Correspondence to: Dr Robertson.

BMJ 1994;309:369-72

had died and attempts were therefore made to contact and interview 180 drug users (60 women, 120 men). Details of deaths were obtained through the General Register Office with which all patients were flagged at recruitment. When contact was made with the patient a structured interview was carried out either at the Muirhouse surgery, at the patient's home, in prison, or elsewhere. This provided demographic data, information on prison experiences, details of sexual behaviour, and drug use from 1982 to the time of interview. The drug use history included information about drugs taken throughout the user's career, route of administration, and sharing of injecting equipment. Subjects were asked whether they had injected during that year and if so the exact number of episodes of sharing.

The main phase of data collection was conducted between January 1990 and December 1992, 96% of all interviews (111/116) being completed between these dates. Additional information from current general practitioners was then added.

Results

The main phase of recruitment into the study was during 1983-5, only 14 subjects being recruited before 1983, of whom two died before 1983. Thus mortality is described as a life table of survival from January 1983 with cohort members contributing to the population at risk on their date of recruitment, truncated at the end of 1992 to allow for possible delays in the reporting of deaths from the General Register Office. There were 40 deaths in the cohort from January 1983 to December 1992. Fifteen deaths were attributed to overdose, concentrated in the early years of follow up, and there were 16 AIDS related deaths, 10 of which occurred in 1991 (fig 1).

Of the 180 injecting drug users (120 men) alive in December 1989, 163 were traced by the end of June 1993. Sixty one (34%) were registered at the Muirhouse Medical Group and 107 were registered elsewhere at follow up (fig 2). Comparison of those interviewed and those traced but not interviewed showed no differences in sex distribution between the groups. Subjects who were interviewed were slightly younger than those who were not (mean age 32.3 years *v* 35.7).

Table I compares the rate of follow up by HIV status as measured during the study. The few interviews in the untested group reflects the fact that people who lost contact with the study had less opportunity to be tested. Thirty general practitioners supplied additional information. Six patients were HIV positive, 10 HIV negative.

The median age of the interviewed group was 29.3 years (interquartile range 26-34). Seventy six patients in the group (66%) had one or more children. Of these patients, 29 of the 51 men (57%) and four of the 25 women (16%) did not live with any of their children. Of the children who lived away, most lived with their other parent; five lived with grandparents, three were

FIG 1—Survival of 201 injecting drug users 1983-92

* Nine died before follow up, general practitioner considered follow up inappropriate in four cases, three had emigrated, one refused.

FIG 2—Follow up status of all 203 cohort members

TABLE I—Follow up of subjects alive in December 1989 by HIV status

Status	No alive at end of 1989	No (%) traced	No (%) of alive interviewed
HIV positive	98	97 (99)	83 (85)
HIV negative	40	37 (93)	25 (63)
Not tested	42	29 (69)	8 (19)
Total	180	163 (91)	116 (64)

adopted, one was with a foster family, and one was in care. Of the 37 women interviewed, 26 had had at least one full term pregnancy, seven at least one spontaneous abortion, and 13 at least one therapeutic abortion. The median number of pregnancies was two, maximum seven.

Interview data disclosed that 85 (73%) injecting drug users had been hospital inpatients at some time, 66 for drug related problems and 16 for psychological problems. Ninety (78%) had been in prison. Of these, 37 (41%) reported having injected drugs while in prison and 28 (76%) having shared injecting equipment in prison. A slightly higher proportion of HIV positive injecting drug users had both injected and shared needles in prison (table II).

TABLE II—Drug use among prisoners by HIV status

Status	No (%) who had been in prison	No (%) who had injected while in prison	No (%) who had shared injecting equipment in prison
HIV positive	67 (82)	28 (42)	22 (79)
HIV negative	17 (68)	6 (35)	4 (67)
Not tested	6 (75)	3 (50)	2 (67)
Total	90 (78)	37 (41)	28 (76)

Of the 116 injecting drug users who were interviewed, 91 reported a sexual relationship with at least one person in the previous six months: 71 had had one partner, 13 two partners, five three partners, one four partners, and one (who worked in the sex industry) 470 partners. Forty four (38%) of the injecting drug users had had sex with a partner known to be infected with HIV at some point. This proportion was higher (37/83; 45%) among HIV positive injecting drug users, though six (24%) of the HIV negative subjects also recalled having sex with an HIV positive person. Of all 91 injecting drug users reporting a sexual relationship in the six months before interview, 39 (64%) of 61 HIV positive subjects and five (22%) of 23 HIV negative subjects reported using condoms. Twenty six of the HIV positive subjects and one HIV negative subject reported always using a condom.

The proportion of the 116 injecting drug users using heroin had fallen steadily. However, the use of other drugs had risen. Figure 3 shows the numbers of patients interviewed using drugs in each year from 1982 to 1990. Pharmaceutical drugs included the benzodiazepines, methadone, and dihydrocodeine, and non-prescribable drugs were heroin, cocaine, cyclizine-dipipanone (Diconal), amphetamines, barbiturates, and buprenorphine.

FIG 3—Number of 116 injecting drug users interviewed who reported using drugs in each year 1982-90

FIG 4—Percentage of injecting drug users who reported sharing needles in each year 1982-90

Injecting drug use had continued to decline since 1983, the sharpest fall occurring between 1984 and 1986 (fig 3). Illegal drug use and sharing of equipment showed a similar trend (fig 4). However, there had been very little fall in the overall level of drug use in the cohort, with a shift towards pharmaceutical drugs. In the last years of the study benzodiazepines were being used in considerable quantities and accounted for a large part of the clinical workload, intravenous use increasing from 2% to 8% (fig 5).

FIG 5—Benzodiazepine use by drug users 1982-90

Of the 116 injecting drug users interviewed, 71 (61%) reported using at least one of the above drugs in every year. Twenty one (18%) users stopped using drugs and did not restart in the period 1982 to 1990, and 24 (21%) reported episodes of abstinence and relapse. Of the 114 who reported injecting, 22 (19%) injected in each year, 54 (47%) stopped injecting, and 38 (33%) showed episodic intravenous drug use.

Discussion

Possibly the most important contribution of this study was the observation on patterns of drug use—that is, the categorisations of drug users into the 18% (21/116) who stopped, and 21% (24/116) who stopped and restarted, and the 61% (71/116) who used continuously. Equally revealing were the three groups of the 114 subjects who reported injecting—19% (22) injecting in every year, 47% (54) stopping injecting, and 33% (38) showing an episodic pattern of injecting. These findings reflect the various responses to aging,

treatments, and changing times and the difficulty of assessing success and failure of treatments. The many subjects who reported continuous or episodic injecting must be a cause of concern and is of considerable interest given the length of follow up. Clearly, a large proportion of drug users sustain drug use over many years, either continuously or episodically.

The change in drug use is dramatically portrayed in figures 3 and 4. The slightly depressing replacement of illegal heroin by prescribed drugs was associated with an encouraging decrease in overall injecting. Once again, however, it is difficult to attribute the decrease in injecting to the prescribing as other factors may influence these changes and the decrease in injecting predated the main prescribing initiatives. An important factor influencing behaviour change was the change in law enforcement which began in 1984. Increased sentences for people convicted of dealing in heroin and even for those found in possession disrupted an active drug using community dramatically. Prescribing services, present in inadequate form throughout this time, were increased only after 1987.¹⁷ Among other influences were the aging of the cohort, their knowledge of HIV, and the new availability of information and other support services. Recent testing for hepatitis C antibody yielded extensively positive results.

This follow up study was successful in tracing a large proportion (163/180; 91%) of the surviving members of the cohort, though only 71% (116) of these were finally interviewed. Those most difficult to locate tended to be the HIV negative or untested drug users who had moved from the practice and who had frequent changes of address. This may indicate a more chaotic lifestyle or alternatively be an indication of an improved situation. There was evidence of both from general practitioner contacts.

The change from overdose to AIDS as a predominant cause of death among injecting drug users is interesting. AIDS deaths will clearly continue but the fall in deaths from overdose is important and may be due more to the lack of heroin and decreased injecting than directly to less overall drug use. The overall mortality is likely to exceed that in other, pre-AIDS studies of survival.¹⁸⁻²⁰

Drug use in prison is reported in many studies, including a recent study in Edinburgh.²¹ From our data we cannot assess whether there might be a causal relation between being in prison and being HIV antibody positive.

The fertility of the group is important, especially in a cohort so heavily infected with HIV, though transmission from mother to child was infrequent in this series.²² The high rate of sexual partners is worrying, though subjects with HIV adopt a greater use of condoms. A high rate of HIV positive partners and a

Clinical and public health implications

- HIV and AIDS now account for more deaths than overdose among Edinburgh drug injectors
- Continued drug injecting is common, and use of oral substitute drugs or illegally acquired drugs is also problematical
- The foreseeable future holds the prospect of continuing problems
- Current policy does not adequately address the difficulties experienced by drug users, either with respect to their immediate needs or in providing for the continuing problems of an aging cohort

greater risk of acquiring HIV by sexual activity than by injecting drugs in recent years, even in known drug users, are reported elsewhere.¹⁶

Cherubin and Sapira's vast review of the (mainly American) published work concludes that the "natural history" of intravenous drug use includes early damaging behaviour followed in the subjects' late 20s and early 30s by attempts to quit drug use and in their late 30s and early 40s by some success in stopping. They also suggested, however, that drug use often continues beyond these decades and that "fifty and sixty year old intravenous drug users" are not rare.²³

Our data fit in with Cherubin and Sapira's suggested pattern of behaviour and fill in some of the details of behaviour during those long decades of drug taking. They should help those interested in drug use behaviour to understand the complexity of the problem and the consequent problems in treatment and prevention. They should also prepare policy makers for a long haul ahead.²⁴

We are grateful to Dr Ken Roberts and Dr Kirsty Foster and the partners of the Muirhouse Medical Group for their support and especially Lesley Devogelaere for all her work on the project.

- 1 Newman RG. Methadone treatment defining and evaluating success. *N Engl J Med* 1988;318:386-7.
- 2 Bewley TH, Ben-Aire O, Pierce James I. Morbidity and mortality from heroin dependence. *BMJ* 1968;i:725-32.
- 3 Bucknall ABV, Robertson JR. Deaths of heroin users in a general practice population. *Journal of the Royal College of General Practitioners* 1986;36:120-2.
- 4 Robins LN. Vietnam's veterans' rapid recovery from heroin addiction: a fluke or normal expectation? *Addiction* 1993;88:1041-5.
- 5 Waldorf D, Biernackie PJ. Natural recovery from heroin addiction: a review of the incidence literature. *Journal of Drug Issues* 1979;9:281-9.

- 6 Advisory Council on the Misuse of Drugs. *AIDS and drug misuse. Part 1.* London: HMSO, 1988.
- 7 Advisory Council on the Misuse of Drugs. *AIDS and drugs misuse. Part 2.* London: HMSO, 1989.
- 8 Advisory Council on the Misuse of Drugs. *AIDS and drugs misuse. Update.* London: HMSO, 1993.
- 9 Medical Working Group on Drug Dependence. *Guidelines of good clinical practice in the management of drug use.* London: DoH, 1992.
- 10 Medical Working Group on Drug Dependence. *Guidelines of good clinical practice in the treatment of drug misuse.* London: DHSS, 1984.
- 11 Department of Health and Social Security. *Misuse of drugs with special reference to the treatment and rehabilitation of misusers of hard drugs.* London: HMSO, 1985.
- 12 Skidmore CA, Robertson JR, Robertson AA, Elton RA. After the epidemic: follow up study of HIV seroprevalence and changing patterns of drug use. *BMJ* 1990;300:219-23.
- 13 Robertson JR, Skidmore CA, Roberts JJK. HIV infection in intravenous drug users: a follow up study indicating changes in risk taking behaviour. *British Journal of Addiction* 1988;83:387-91.
- 14 Skidmore CA, Robertson JR, Roberts JJK. Changes in HIV risk taking behaviour in intravenous drug users: a second follow up. *British Journal of Addiction* 1989;84:695-6.
- 15 Ronald PJM, Robertson JR, Roberts JJK. Risk taking behaviour on the decline in intravenous drug users. *British Journal of Addiction* 1992;82:115-6.
- 16 Ronald PJM, Robertson JR, Wyld R, Weightman R. Heterosexual transmission of HIV in injecting drug users. *BMJ* 1993;307:1184-5.
- 17 Greenwood J. Creating a new drug service in Edinburgh. *BMJ* 1990;300:587-9.
- 18 Stimson GB, Oppenheimer E, Thorley A. Seven year follow up of heroin addicts: current use and basic outcome. *BMJ* 1978;i:1190-2.
- 19 Valliant GE. A 20 year follow up of New York narcotic addicts. *Arch Gen Psychiatry* 1973;29:237-41.
- 20 Chapple PA, Somekh DE, Taylor ME. A five year follow up of 108 cases of opiate addiction. 1. General findings and a suggested method of staging. *British Journal of Addiction* 1972;67:33-8.
- 21 Bath GE, Davie AG, Domity NJ, Peters A, Raab GM, Richardson AM. Imprisonment and HIV prevalence. *Lancet* 1993;342:1368.
- 22 European Collaborative Study Group. Mother-to-child transmission of HIV infection. *Lancet* 1988;ii:1039-42.
- 23 Cherubin CE, Sapira JD. The medical complications of drug addiction and the medical assessment of the intravenous drug user: 25 years later. *Ann Intern Med* 1993;119:1017-28.
- 24 Selwyn PA. Illicit drug use revisited: what a long, strange trip it's been. *Ann Intern Med* 1993;119:1044-5.

(Accepted 8 June 1994)

Variation in coverage by ethnic group of neonatal (Guthrie) screening programme in south London

Allison Streetly, Carol Grant, Graham Bickler, Paul Eldridge, Susan Bird, Wyn Griffiths

Abstract

Objectives—To determine whether coverage of the neonatal (Guthrie) screening programme in Britain is different for groups at highest risk of sickle cell disease and to identify possible reasons for incomplete coverage.

Design—Descriptive study of coverage of screening programme and its variation by mobility, district of residence, and ethnic group.

Subjects—1727 infants born between 1 October and 31 December 1991.

Setting—Former West Lambeth and Camberwell District Health Authorities, London.

Main outcome measure—Proportion of infants with an identifiable screening test result.

Results—Screening covered 1663/1727 (96.3%) infants overall (745/786 (94.8%) in West Lambeth; 918/941 (97.6%) in Camberwell). The relative odds ratio of an African infant not having been tested compared with a white infant was 3.05 (95% confidence interval 1.30 to 7.14) (2.08 (0.86 to 5.01) after adjustment for mobility and district of residence). For infants whose families moved into the districts after the birth compared with those born and resident in the districts the relative odds ratio of having been tested was 10.16 (4.85 to 21.29). The odds ratio of locally delivered infants in West Lambeth not having been tested compared with those in Camberwell was 2.12 (1.08 to 4.16) after adjustment for ethnic group.

Conclusion—Coverage of the screening programme is incomplete and poorer in infants of African ethnic group than in white infants. Poorer coverage is also associated with mobility of the family around the time of birth. The findings have implications for using the neonatal programme for testing for sickle cell disease and other disorders. Arrangements for monitoring the existing screening programme are inadequate and an improved system should be established, similar to the scheme that monitors the immunisation programme.

Introduction

A screening programme to test newborn infants' blood for phenylketonuria (through the use of Guthrie cards) was established in Britain in the 1970s.¹ Testing for congenital hypothyroidism was added to the programme in 1981.² In some places tests for other disorders, such as cystic fibrosis and sickle cell disease, have been added. Nationally the programme seems effective in detecting affected infants, and treatment is started early.³ Recent estimates of coverage range from 93% to 100%.⁴⁻⁶ Infants at risk of not being tested include those born outside Britain; those living in inner cities; those in special care baby units; and in the United States those born at home, those who are black, those at high risk for HIV, and those with low birth weight.⁷⁻¹⁰

After a pilot study in east Lambeth and south

United Medical and Dental Schools, Department of Public Health Medicine, St Thomas's Hospital, London SE1 7EH
Allison Streetly, senior registrar in public health medicine

Lambeth, Southwark, and Lewisham Health Commission, London SE1 7RJ
Carol Grant, research assistant
Graham Bickler, acting director of public health

Department of Clinical Chemistry, Lewisham Hospital NHS Trust, London SE13 6LH
Paul Eldridge, consultant biochemist
Wyn Griffiths, principal biochemist

Department of Clinical Biochemistry, Guy's Hospital, London SE1 9RT
Susan Bird, principal biochemist

Correspondence to:
Dr A Streetly, Bexley and Greenwich Health, 221 Erith Road, Bexleyheath, Kent DH7 6HZ.

BMJ 1994;309:372-4